

CA2 ALA
66R15
C-1

134/14

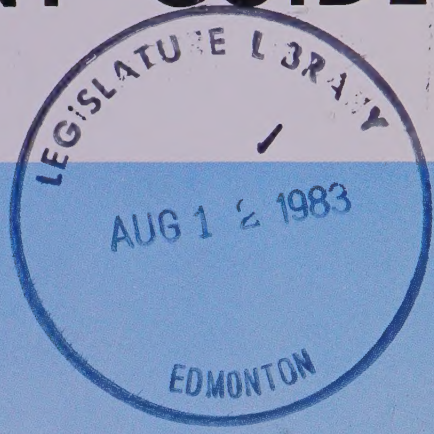
5M-66

ALBERTA RANGE MANAGEMENT GUIDE

CA2 ALA 1966R15
Alberta Range Management Guide. 1966. 1



3 3398 00128 4222



LIBRARY
VAULT 19



**ALBERTA DEPARTMENT
of
AGRICULTURE
★
LANDS & FORESTS**



Digitized by the Internet Archive
in 2022 with funding from

Legislative Assembly of Alberta - Alberta Legislature Library

ALBERTA RANGE MANAGEMENT GUIDE

**A. Johnston and S. Smoliak
Canada Agriculture Research Station
Lethbridge, Alberta**

**L. M. Forbes and J. A. Campbell
Alberta Department of Lands and Forests
Edmonton, Alberta**

**Hon. H. E. Strom, Minister
Department of Agriculture**

**Hon. Dr. Allan A. Warrack, P.Ag. , Minister
Department of Lands & Forests**

INDEX

Page

Introduction	1
Definitions	3
Fenceline Contrasts	3
Carryover	5
Range types	
Mixed Prairie	8
Needle-and-Thread/Blue Grama Grass	10
Needle-and-Thread/Blue Grama Grass/Wheatgrass	11
Western Wheatgrass	14
Western Porcupine Grass/Wheatgrass	17
Fescue Grassland	20
Woodland Pastures	23
Miscellaneous Pastures	28
Glossary of Common and Scientific Names of Plants	31

ALBERTA RANGE MANAGEMENT GUIDE

INTRODUCTION

More livestock will be needed to meet future demands for beef. These will be provided in several ways, one of which will be by more intensive use of those areas now producing livestock. Thus our range-lands must assume a greater share of the livestock load, especially in spring and summer. Management of the range must be improved because of this additional use.

The purpose of this publication is to provide a guide to "range condition". It can be used throughout the Province (Fig. 1).

Range condition is defined as "the present state of the vegetation compared with what the range is capable of producing". Range condition has also been called range health. Range condition classes are: excellent, good, fair, and poor.

The best range is the one that is closest in appearance and yield to the original or 'climax' cover. As weedy and unpalatable plants come into a range, its value decreases. In the last stages of heavy use, worthless perennials, annual weeds, and bare ground occupy the area that should be growing good forage plants.

The guide will show what is happening to the range plants and will provide a range condition rating that can be related to stocking rate. The stocking rates, with carryover allowances included, are such that excellent or good condition range will be maintained while fair or poor condition range will be improved. Poor condition range will be raised to fair condition, later to good condition. This will avoid drastic cuts in animal numbers.

DEFINITIONS

A few definitions are essential so that the remaining discussion may be more clearly understood.¹

Acres per Animal Unit Month (Ac./AUM). The estimated number of acres necessary to provide forage for one animal unit for one month under proper use.

Animal Unit. (A. U.) Considered to be one mature cow with calf or their equivalent.

Decreaser Plant Species. Plant species of the original vegetation that will decrease in relative amount with continued overuse. Often termed **decreasers**.

Increaser Plant Species. Plant species of the original vegetation that increase in relative amount, at least for a time, with continued overuse. Commonly called **increasers**.

Invader Plant Species. Plant species that are absent in undisturbed portions of the original vegetation and will invade under disturbance or continued overuse. Commonly called **invaders**.

Range Condition. The state and health of the range based on what the range is naturally capable of producing.

Range Condition Class. One of a series of arbitrary categories used to classify range condition and expressed as either excellent, good, fair, or poor.

Range Condition Trend. The direction of change in range condition and soil. Also called **range trend**, **trend in range condition**, and **trend**.

Utilization Cut. A reduction in stocking rate because less productive sites make up an appreciable part of the pasture, for example, wooded, barren, or inaccessible area.

FENCELINE CONTRASTS

All the different vegetation types cannot be illustrated in this publication. The differences in their productivity can be observed by comparing adjoining areas. Such comparisons are best made where "fenceline contrasts" exist.

Fenceline contrasts (Figs. 2 and 3) are adjoining areas of similar soil and slope that have been treated differently. For example, a fence may separate an ungrazed road allowance and an overgrazed pasture. The ungrazed road allowance shows how the range could look under good management practices; the overgrazed pasture shows what man has done to the range.

Research has shown that the original or 'climax' cover is the most productive cover. Ungrazed range is closer to the original cover than grazed range. Thus ungrazed areas are used to indicate how ranges of a district should look when in their most productive state. Range can be managed to maintain it in good to excellent condition.

¹From "A Glossary of Terms Used in Range Management" published by American Society of Range Management, P.O. Box 5041, Portland, Oregon. 1964.



Figure 2. Fenceline contrast in the Fescue grassland type. A study of both sides of the fence will provide much information about the vegetation.



Figure 3. Fenceline contrast in the Mixed Prairie type. Mid-grasses dominate the lightly grazed area; shortgrowing grasses and weeds cover the heavily grazed area.

Ungrazed woodland pastures show the kind and amount of desirable species that are present in the undergrowth; examination of grazed woodland pastures show how management has affected these desirable species.

CARRYOVER

‘Carryover’ is the grass on the ground at the end of the grazing season. On summer ranges, carryover should be 45 per cent of the current year’s growth of grass. Carryover is easily seen and may be used as one indicator of range condition.

Carryover is necessary because plants manufacture their own food in the green leaves. On summer ranges about one-half of the leafage must be left to provide for food manufacture; reserve food is stored in the roots. Carryover traps some snow and increases the soil moisture. It protects the crowns of plants. It allows for production of seed.

A carryover of 45 per cent every year is an impractical goal. Yields vary widely from year to year and, in a stable livestock operation, carryover will vary widely also. Range will not be damaged by overuse during dry years when growth and carryover are low because it will regain vigor during wet years when growth and carryover are high. The rancher must aim at a rate of grazing that, over a period of years, will leave 45 per cent of the forage on the ground as carryover.

Carryover is not as important on winter fields because all necessary food has been stored in the roots before grazing. Stocking rates can be considerably increased if grazing is limited to the winter season. Carryover can be less than 45 per cent on cultivated pastures because the cultivated grasses can tolerate more foliage removal than the native grasses.

A field with adequate carryover will have a ragged, not a ‘slicked-off’, appearance. This is shown in Figs. 4 and 5.



Figure 4. Carryover on Mixed Prairie at Manyberries. Amount of carryover is estimated as (1) 75 per cent, (2) 45 percent, (3) 25 per cent, and (4) 5 per cent of the current year's growth of grass.

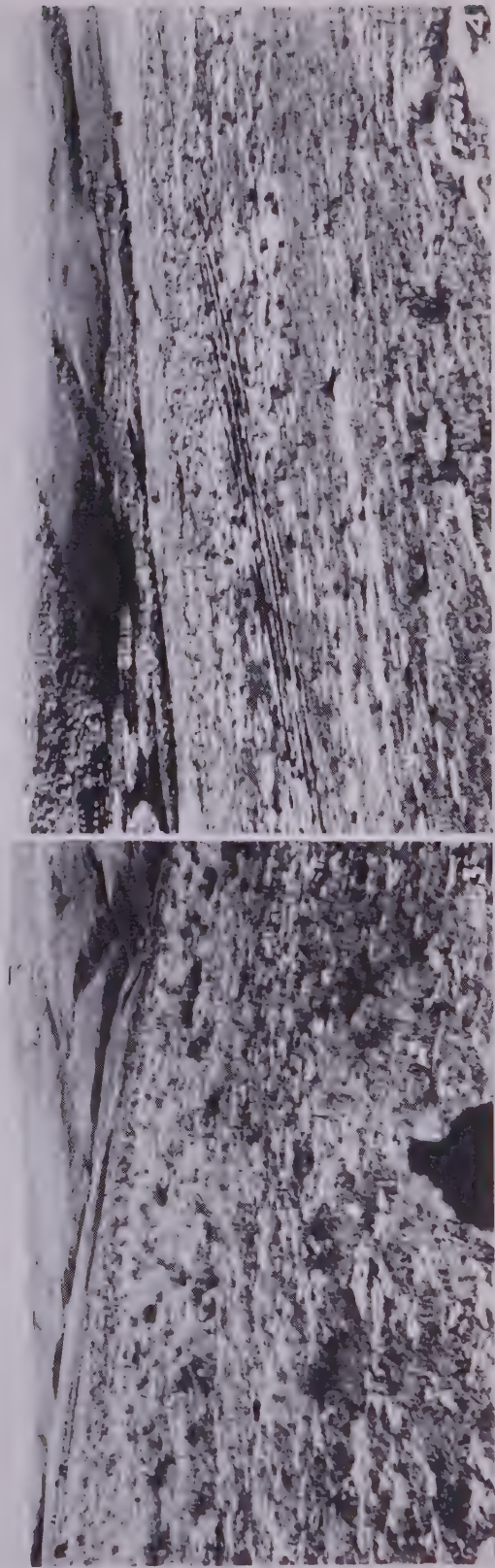
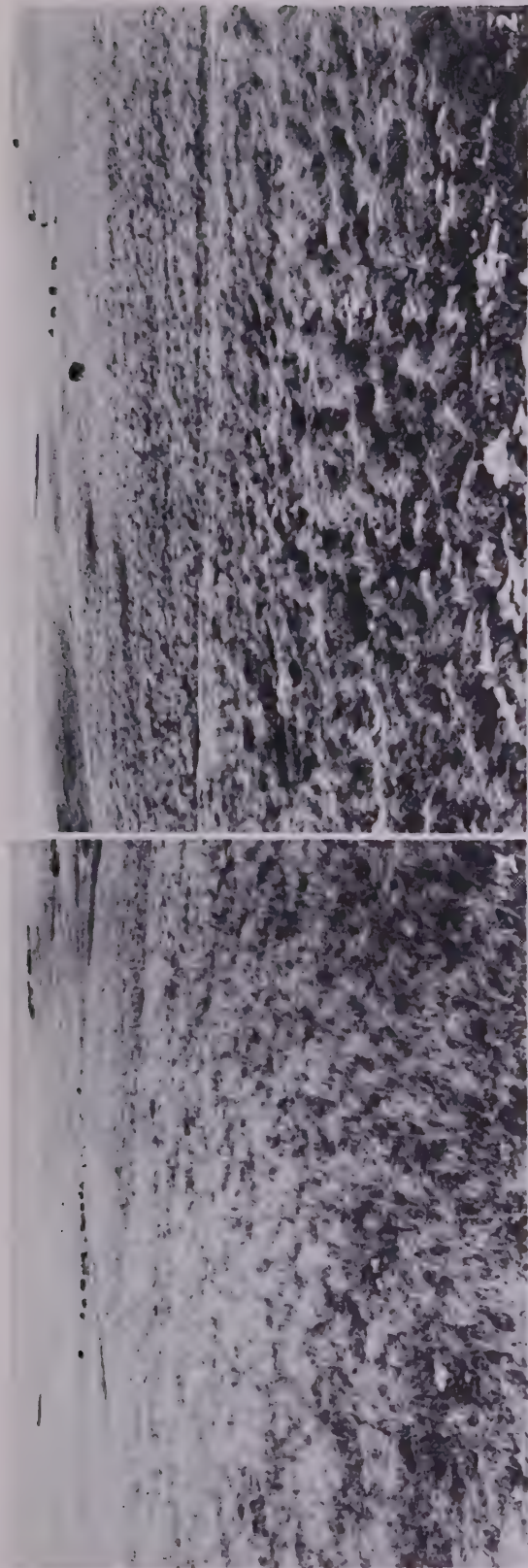


Figure 5. Carryover on Fescue Grassland at Stavely. Amount of carryover is estimated as (1) 75 per cent, (2) 45 per cent, (3) 25 per cent, and (4) 5 per cent of the current year's growth of grass.

THE MIXED PRAIRIE

Mixed Prairie occupies the Brown and much of the Dark Brown soils zones. The grassland is dominated by six grass species: needle-and-thread, western porcupine grass, blue grama grass, northern wheatgrass, western wheatgrass, and June grass. Important weedy plants include fringed sage, moss phlox, scarlet globe mallow, silver sage, goldenrod, rose, and sagebrush. These plants occur in various combinations depending on local climate. Three types of Mixed Prairie are illustrated in this publication, namely, those in which needle-and-thread, western wheatgrass, and western porcupine grass are the dominant species. Blue grama grass is a part of all three types. One other type is discussed.

The needle-and-thread/blue grama/western wheatgrass type is the most extensive. It occurs on medium-textured soils in the moister parts of the Brown and the drier parts of the Dark Brown soils zones. A needle-and-thread/blue grama grass combination occurs on medium- to coarse-textured soils in the drier parts of the Brown soils zone, on coarse-textured soils in the moister part of the Brown soils zone, and on exposed sites throughout southern Alberta.

The western wheatgrass type occurs, with June grass, on clay soils of old lake beds. When these soils are alkaline, western wheatgrass alone may dominate. Western wheatgrass, with blue grama grass, is found on clay loam, solonchic soils (burn-outs) of the drier parts of the Brown soils zone; cactus is widespread in this type.

The western porcupine grass/wheatgrass type is present on moist soils throughout, but particularly on well-developed soils in the Dark Brown and adjacent parts of the Brown soils zones. Other species of spear grass may be abundant locally.

All these vegetation types blend into one another and many combinations are possible (Table 1).

Table 1. Percentage ground covers, estimated mean yields, and carrying capacities at sites in each of two grassland associations.¹

Plant species or other item	Mixed Prairie				Fescue Prairie	
	1	2	3	4	1	2
Grasses and sedges:						
Blue grama grass	4.1	7.3	1.8	2.0	—	—
Needle-and-thread	0.7	1.3	1.4	0.4	—	—
Sandberg's blue grass	1.0	0.8	0.5	—	—	—
June grass	0.5	1.0	0.9	1.0	0.4	1.2
Western wheatgrass	1.4	0.7	0.7	0.6	1.6	0.7
Sun-loving sedge	0.5	1.7	1.5	1.6	1.3	2.2
Western porcupine grass	—	P	1.9	2.4	1.6	0.1
Northern wheatgrass	—	P	0.8	0.5	1.1	0.6
Rough fescue	—	—	0.5	1.6	3.2	4.6
Idaho fescue	—	—	—	—	0.1	1.1
Parry's oatgrass	—	—	—	—	—	5.0
Other grasses and sedges ..	0.4	1.1	1.1	0.4	2.1	1.2
Forbs and weeds:						
Pasture sage	0.5	0.7	1.6	2.5	P	—
Moss phlox	0.2	0.5	0.2	0.4	—	—
Roses	—	P	0.2	0.1	0.9	0.2
Western snowberry	—	P	0.1	0.1	0.4	0.2
Three-flowered avens	—	—	P	P	0.6	0.3
Silvery lupine	—	—	—	—	0.1	0.4
Shrubby cinquefoil	—	—	—	—	0.2	1.3
Aspen	—	—	—	—	P	—
Other forbs and weeds	0.7	0.4	1.2	1.1	3.5	3.6
Little club moss	6.5	8.7	3.2	4.1	0.8	P
Estimated yield in						
pounds DM per acre	270	330	425	550	660	1080
Acres per AUM	4.5	3.5	2.8	2.2	1.8	1.1

¹From Range Management of grasslands and adjacent parklands in the Prairie Provinces. Can. Department of Agriculture, Publication 1133, 1962.
P—present in small amounts.

Needle-and-Thread / Blue Grama Grass Type

These grasslands occur where the average annual precipitation is 10 to 14 inches and evaporation is high. They are known as “The Short-grass Plains”. The grasses are high in nutritive value and cure on the stem. Thus they provide winter grazing for livestock. Snowfall is light and the winters are usually open. Chinook winds moderate the winter weather but may produce icing conditions. In summer these winds cause rapid loss of soil moisture.

Needle-and-thread and blue grama grass have the highest ground cover although other grasses may dominate locally. Needle-and-thread is abundant on deep loam soils. Thread-leaved sedge is abundant on eroded sites and hillsides.

Overgrazing reduces needle-and-thread, June grass, and western wheatgrass. Blue grama grass and Sandberg’s blue grass increase as do fringed sage, broomweed, cactus, moss phlox, and other weeds. The first evidence of overgrazing is a lower yield of forage as the productive mid-grasses disappear. This is followed by an increase in weedy species and a further reduction in carrying capacity.

Native Vegetation

<u>Decreasers</u>	<u>Increases</u>	<u>Invaders</u>
Needle-and-thread	Blue grama grass	Russian thistle
June grass	Sandberg’s blue grass	Foxtail barley
Northern wheatgrass	Thread-leaved sedge	All other annuals
Western wheatgrass	Fringed sage	and exotics
Green needle grass	Moss phlox	Gumweed
Forb decreaseers	Little club moss	Broomweed
Winter fat	Cactus	Dandelion
Nuttall’s salt sage	Sagebrush	Goosefoots
		Goat’s-beard

Forage Yields

Forage yields, in pounds dry matter per acre, and average stocking rates, in acres per animal unit month, for the four condition classes are:

	Excellent	Good	Fair	Poor
Average yield _____	340	280	215	140
Range in yield _____	275 - 500	200 - 425	150 - 325	90 - 250
Stocking rate _____	3.5	4.3	5.6	8.6

Needle-and-Thread/Blue Grama Grass/Wheatgrass Type

Mid-grasses are abundant in these grasslands. About 70 per cent of the total vegetation is needle-and-thread, western porcupine grass, blue grama grass, and the wheatgrasses.

With care, the mid-grasses can be maintained in the pasture. As pastures are overused, the mid-grasses disappear and blue grama grass increases. As overuse continues, pasture weeds increase, especially fringed sage, moss phlox, broomweed, and crocus.

Annual precipitation is from 10 to 14 inches; evaporation is slightly less than in the needle-and-thread/blue grama grass type.

Native Vegetation

<u>Decreasers</u>	<u>Increasesers</u>	<u>Invaders</u>
Needle-and-thread	Blue grama grass	Foxtail barley
Western wheatgrass	Sandberg's blue	Cheatgrass
Western porcupine	grass	All other annuals
grass	June grass	and exotics
Green needle grass	Plains reed grass	Gumweed
Northern wheatgrass	Prairie muhly	Broomweed
Forb decreaseers	Sedges	Dandelion
Winter fat	Forb increaseers	Russian thistle
	Fringed sage	Goosefoots
	Crocus	Goat's-beard
	Sagebrush	
	Moss phlox	
	Little club moss	
	Cactus	

Forage Yields

Forage yields, in pounds per acre, and average stocking rates, in acres per animal unit month, for the four condition classes are:

	Excellent	Good	Fair	Poor
Average yield _____	450	345	275	190
Range in yield _____	300 - 850	250 - 650	200 - 450	150 - 250
Stocking rate _____	2.7	3.5	4.4	6.3



Figure 6. Needle-and-thread/blue grama grass/wheatgrass type in excellent condition. Mid - grasses dominate the range and there are few weeds.



Figure 7. Needle-and-thread/blue grama grass/wheatgrass type in good condition. Mid-grasses dominate but some weedy plants will be seen.



Figure 8. Needle-and-thread/blue grama grass/wheatgrass type in fair condition. Mid-grasses mostly gone but blue grama grass prominent in the cover. Many weeds.



Figure 9. Needle-and-thread/blue grama grass/wheatgrass type in poor condition. Cover has deteriorated to remnants of grass, annual and perennial weeds.

Western Wheatgrass Types

These grasslands occur on a variety of soils but usually on spring-flooded clay soils. Many are used as native hay meadows. This is probably their best use. June grass is an associated grass where there is no salinity. Blue grama grass grows with western wheatgrass on clay loam, solonchic soils in southeastern Alberta; cactus may become abundant on this type. Both western and beardless wheatgrass may dominate on upland clay soils; green needle grass is often a co-dominant. Northern wheatgrass may be important in sandhill prairie.

These grasslands are productive, especially the native hay meadows. Stock tend to concentrate on these areas and careful management is needed to keep these grasslands in good condition.

Grasslands of the Peace River area belong to a wheatgrass/spear-grass type. Sedges are abundant, especially in low places.

Native Vegetation

<u>Decreasers</u>	<u>Increasesers</u>	<u>Invaders</u>
Western wheatgrass	Blue grama grass	Foxtail barley
Western porcupine grass	June grass	All other annuals and exotics
Needle-and-thread	Sandberg's blue grass	Gumweed
Green needle grass	Sedges	Broomweed
Slender wheatgrass	Fringed sage	Goat's-beard
Northern wheatgrass	Cactus	
Winter fat	Roses	
	Sagebrush	
	Greasewood	

Forage Yields

Forage yields, in pounds per acre, and average stocking rates, in acres per animal unit month, for the four condition classes are:

	Excellent	Good	Fair	Poor
Average yield _____	575	450	350	250
Range in yield _____	350 - 950	300 - 800	250 - 650	200 - 400
Stocking rate _____	2.1	2.7	3.4	4.8



Figure 10. Wheatgrass type in excellent condition. Cover is grassy and is mostly wheatgrasses; green needle grass or June grass may be common.



Figure 11. Wheatgrass type in good condition. Cover is grassy but sagebrush plants may be noticeable.



Figure 12. Wheatgrass type in fair condition. Only small amounts of the wheatgrasses remain, often considerable blue grama grass, shrubby plants.



Figure 13. Wheatgrass type in poor condition. Cover is mostly shrubby weeds, bare baked ground, salt-tolerant annuals. Much cactus may be present.

Western Porcupine Grass/Wheatgrass Type

These grasslands occupy moister sites in the Brown and Dark Brown soils zones. They tend to be transitional between the Mixed Prairie and the Fescue Grassland and are difficult to assess. The original grasslands were dominated by western porcupine grass with varying amounts of northern and western wheatgrass, June grass, rough fescue, and, on sandy soils, blue grama grass. Low-growing species such as blue grama grass, sedge, and June grass as well as fringed sage and other shrubs become abundant on over-grazed range.

The western porcupine grass/wheatgrass type was the most favorable area open to settlement; today most is farmed. Only the stony, sandy, or rough portions are grazed.

Annual precipitation ranges from 14 to 18 inches while evaporation is less than in the needle-and-thread/blue grama grass type.

Native Vegetation

<u>Decreasers</u>	<u>Increasesrs</u>	<u>Invaders</u>
Western porcupine grass	Blue grama grass	Kentucky bluegrass
Wheatgrasses	June grass	Peppergrass
Rough fescue	Sedges	Gumweed
Canada wild ryegrass	Fringed sage	All other annuals and exotics
Brome	Prairie rose	Goat's-beard
Green needle grass	Western snowberry	Dandelion
	Moss phlox	Canada thistle
	Little club moss	Leafy spurge
	Silver sagebrush	

Forage Yields

Forage yields, in pounds per acre, and average stocking rates, in acres per animal unit month, for the four condition classes are:

	Excellent	Good	Fair	Poor
Average yield _____	600	490	365	270
Range in yield _____	390 - 1200	300 - 900	250 - 650	200 - 450
Stocking rate _____	2.0	2.4	3.3	4.4



Figure 14. Western porcupine grass/wheatgrass type in excellent condition. Western porcupine grass dominates, other grasses include needle-and-thread, June grass, and wheat-grasses.



Figure 15. Western porcupine grass/wheatgrass type in good condition. Western porcupine grass, wheatgrasses, and needle-and-thread are all important in the cover, few weedy plants evident.



Figure 16. Western porcupine grass/wheatgrass in fair condition. Needle-and-thread present with remnants of western porcupine grass, blue grama grass may be abundant, also fringed sage and other weedy plants.



Figure 17. Western porcupine grass/wheatgrass in poor condition. Remaining grass mostly blue grama grass, broomweed, fringed sage, and other weedy plants make up most of the cover.

FESCUE GRASSLAND

These grasslands are distinguished by the presence of rough fescue. Fescue grassland is present in the foothills, other hilly areas, and over much of the Black soils zone. Only the stony, sandy, or rough portions are grazed; the rest is farmed.

Rough fescue is sensitive to summer grazing and disappears when used heavily. Thus the presence of rough fescue indicates good condition. In the southern foothills, rough fescue is replaced by Parry's oatgrass, Idaho fescue, wheatgrasses, and June grass when grazing becomes heavy. Prolonged misuse results in a cover of weeds, including fringed sage, shrubby cinquefoil, pussy-toes, and annuals. Elsewhere rough fescue is replaced by western porcupine grass, wheatgrasses, June grass, bluegrasses, sedges, and various weeds.

Annual precipitation ranges from 18 to 22 inches with low amounts of evaporation.

Native Vegetation

Decreasers

Rough fescue
Columbia needle
grass
Richardson needle
grass
Western porcupine
grass
Bearded wheatgrass
Canada wild
ryegrass
Montana brome-
grass
Nuttall alkali grass
Forb decreaseers
Woody decreaseers

Increasesers

Parry's oatgrass
Intermediate oat-
grass
Idaho fescue
Western wheatgrass
Needle-and-thread
June grass
Plains reed grass
Tufted hairgrass
Sedge increaseers
Western snowberry
Sagebrushes
Shrubby cinquefoil
Other woody plants
Forb increaseers

Invaders

Kentucky bluegrass
Timothy
All other annuals
and exotics
Foxtail barley
Dandelion
Goat's-beard

Forage Yields

Forage yields, in pounds per acre, and average stocking rates, in acres per animal unit month, for the four condition classes are:

	Excellent	Good	Fair	Poor
Average yield _____	825	600	450	365
Range in yield _____	660 - 1750	400 - 1200	300 - 650	250 - 550
Stocking rate _____	1.5	2.0	2.7	3.3



Figure 18. Fescue grassland in excellent condition. Rough fescue dominates, clumps are large, cover is mostly grass.



Figure 19. Fescue grassland in good condition. Rough fescue a co-dominant with Parry's oatgrass in southern foothills, with western porcupine grass elsewhere. Few weedy plants evident.



Figure 20. Fescue grassland in fair condition. Only remnants of rough fescue remain, secondary grasses important but many weedy plants.



Figure 21. Fescue grassland in poor condition. Rough fescue and other mid-grasses gone, weedy plants make up most of the cover, pussy-toes often prominent in patches.

WOODLAND PASTURES

These include the Parkland and the extensive Sub-Boreal Forest that runs northward from about the North Saskatchewan River. Parkland is grassland interspersed with groves of aspen, poplar, and willow; these groves become near-solid brush at the boundary of the parkland and the northern forest. Tree cover in the Sub-Boreal Forest includes willow, poplar, and pine with white spruce, the climax vegetation. The height and density of the trees and the resultant shading effect limits the growth of grass and other forage plants.

Forage plants in wooded areas are low in nutritive value and worthless for winter grazing. A livestock enterprise must have considerable cultivated land as the long winter feeding period requires up to 2.5 tons of feed per animal unit over-wintered. Native haylands, in the north, are usually low-lying areas with a cover of sedge or spangletop. The hay is soft and inferior and serves as a source of roughage rather than good fodder.

In partially wooded areas, such as the foothills, brush is valuable as shelter. In spite of the danger of larkspur poisoning, these areas can be grazed safely after August 1. No utilization cuts are made until more than one-third of the area is covered by brush. (This figure was chosen for administrative convenience although any brush invasion reduces carrying capacity.)

A rule of thumb that is used to indicate condition of woodland pastures is: Pastures are in good condition when peavine and vetch are present; they are in poor condition when these species disappear.

Carrying capacities in use by the Alberta Department of Lands and Forests are illustrated in Figs. 22, 23, 24, 25, 26, 27, 28, and 29.



Figure 22. Carrying capacity—2.7 acres per AUM. These are partially wooded pastures in the foothills. Willow and poplar occupy 34 to 50 per cent of the grazing area. The remainder is open grassland of the fescue grassland type.



Figure 23. Carrying capacity—3.3 acres per AUM. Partially wooded pastures where willow and poplar make up from 50 to 75 per cent of the area available for grazing. The remainder is open grassland of the fescue grassland type.



Figure 24. Carrying capacity—3.8 acres per AUM. Wooded pastures where the cover is mostly willow and poplar with frequent small areas of grassland of the fescue grassland type.



Figure 25. Carrying capacity—4.2 acres per AUM. Cover consists of willow, poplar, scattered pine, and spruce with an under-story of hairy wild rye, bluegrasses, vetch, and peavine.



Figure 26. Carrying capacity—4.7 acres per AUM. Cover consists of some willow and poplar with frequent pine and spruce with an understory of hairy wild rye, bluegrasses, vetch, and peavine.



Figure 27. Carrying capacity—5.0 acres per AUM. Cover consists of fairly heavy stands of pine and spruce with an understory of pine grass, hairy wild rye, and bluegrasses.



Figure 28. Carrying capacity—5.0-plus acres per AUM. Heavily wooded northern pastures with frequent areas of muskeg, occasional open patches of Canada reed grass and sedges.



Figure 29. Carrying capacity—5.0-plus acres per AUM. Muskeg, organic soils of low value, which consist of low shrubs and some trees (black spruce) with an understory of mosses. Of limited value where the peat is shallow.

MISCELLANEOUS PASTURES

There are many other kinds of pastures. Four common types — wetlands, sandhills, abandoned lands, and badlands — are illustrated in Figs. 30, 31, 32, and 33.



Figure 30. Wetlands, the most productive natural pastures, are areas that are sub-irrigated or flooded occasionally. These can usually be stocked at from 0.7 to 1.5 acres per AUM.



Figure 31. Sandhills often support woody vegetation because of permeability of soil; active sand dunes may be present. These need careful management to avoid wind erosion and may be stocked at 5.0-plus acres per AUM.



Figure 32. Abandoned lands. Formerly cultivated lands that have been allowed to go back to grass. Cover is still mostly weeds and carrying capacity is very low—from 6 to 15 acres per AUM. These areas should be seeded to a cultivated grass.



Figure 33. Badlands. Nearly barren lands with a very low pasture potential. These are most useful for protection from winter storms.

COMMON AND SCIENTIFIC NAMES OF PLANTS MENTIONED

Grasses

Bearded wheatgrass	<i>Agropyron subsecundum</i>
Blue grama grass	<i>Bouteloua gracilis</i>
Bluegrasses	<i>Poa</i> spp.
Brome	<i>Bromus</i> spp.
Canada wild rye	<i>Elymus canadensis</i>
Cheatgrass	<i>Bromus tectorum</i>
Columbia needle grass	<i>Stipa columbiana</i>
Foxtail barley	<i>Hordeum jubatum</i>
Green needle grass	<i>Stipa viridula</i>
Hairy wild rye	<i>Elymus innovatus</i>
Idaho fescue	<i>Festuca idahoensis</i>
Intermediate oat grass	<i>Danthonia intermedia</i>
June grass	<i>Koeleria cristata</i>
Kentucky bluegrass	<i>Poa pratensis</i>
Mountain brome	<i>Bromus marginatus</i>
Needle-and-thread	<i>Stipa comata</i>
Northern wheatgrass	<i>Agropyron dasystachyum</i>
Nuttall alkali grass	<i>Puccinellia nuttalliana</i>
Parry's oat grass	<i>Danthonia parryi</i>
Pine grass	<i>Calamagrostis rubescens</i>
Plains reed grass	<i>Calamagrostis montanensis</i>
Prairie muhly	<i>Muhlenbergia cuspidata</i>
Richardson's needle grass	<i>Stipa richardsonii</i>
Rough fescue	<i>Festuca scabrella</i>
Sandberg's bluegrass	<i>Poa secunda</i>
Slender wheatgrass	<i>Agropyron trachycaulum</i>
Spangletop	<i>Scolochloa festucea</i>
Timothy	<i>Phleum pratense</i>
Tufted hairgrass	<i>Deschampsia caespitosa</i>
Western porcupine grass	<i>Stipa spartea</i> var. <i>curtiseta</i>
Western wheatgrass	<i>Agropyron smithii</i>

Sedge

Sedge	<i>Carex</i> spp.
Thread-leaved sedge	<i>Carex filifolia</i>

Forbs, Shrubs, and Trees

Broomweed	Gutierrezia diversifolia
Cactus	Opuntia spp.
Canada thistle	Cirsium arvense
Dandelion	Taraxacum officinale
Fringed sage	Artemisia frigida
Goat's-beard	Tragapogon dubius
Goldenrod	Solidago spp.
Goosefoots	Chenopodium spp.
Greasewood	Sarcobatus vermiculatus
Gumweed	Grindelia squarrosa
Larkspur	Delphinium spp.
Leafy spurge	Euphorbia esula
Little club moss	Selaginella densa
Moss phlox	Phlox hoodii
Nuttall's salt sage	Atriplex nuttallii
Peavine	Lathyrus ochroleucus
Peppergrass	Lepidium densiflorum
Poplar	Populus spp.
Pine	Pinus spp.
Rose	Rosa spp.
Russian thistle	Salsola kali
Sagebrush	Artemisia cana
Scarlet globe mallow	Sphaeralcea coccinea
Shrubby cinquefoil	Potentilla fruticosa
Silver sage	Artemisia gnaphalodes
Vetch	Vicia spp.
Western snowberry	Symphoricarpos occidentalis
White spruce	Picea glauca
Willow	Salix spp.
Winter fat	Eurotia lanata

Copies of this publication may be obtained from:

Publication Office — Extension Division

DEPARTMENT OF AGRICULTURE

EDMONTON, Alberta

or

Your DISTRICT AGRICULTURIST